November 1920. ENTOMOLOGICAL SERIES VOL. VI, No. 5.

MEMOIRS OF THE DEPARTMENT OF AGRICULTURE IN INDIA

LIFE-HISTORIES OF INDIAN INSECTS MICROLEPIDOPTERA

V. HELIOZELIDÆ, HELIODINIDÆ GLYPHIPTERYGIDÆ BLASTOBASIIÆ AND HYPONOMEUTIDÆ

BY

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Imperial Entomologist

AGRICULTURAL RESEARCH INSTITUTE, PUSA

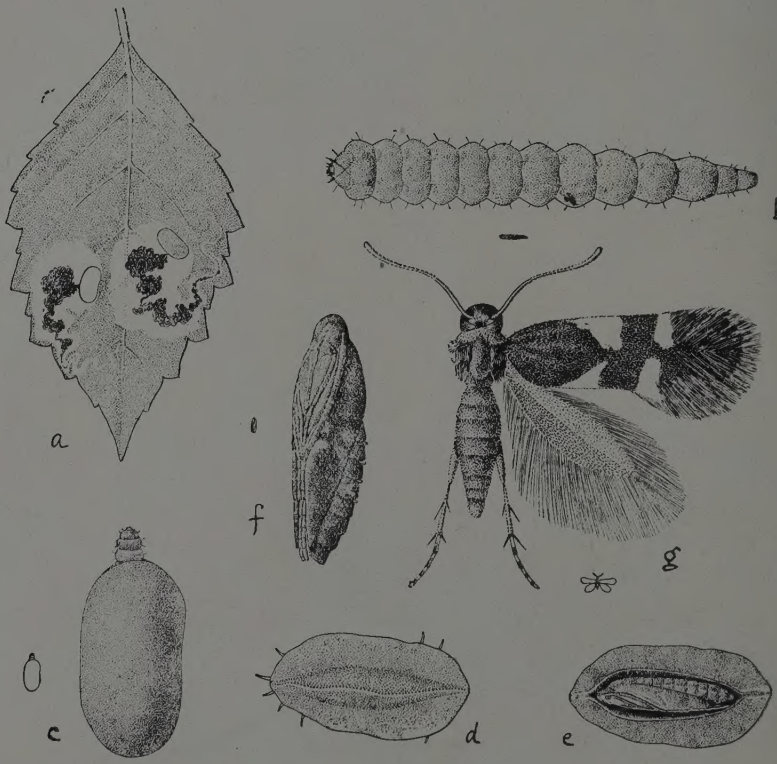
PRINTED AND PUBLISHED FOR

THE IMPERIAL DEPARTMENT OF AGRICULTURE IN INDIA

BY

THACKER, SPINK & CO., CALCUTTA

W. THACKER & CO., 2, CREED LANE, LONDON



Antispila argostoma:—

a, mined leaf of *Vitis trifolia* showing two larval galleries, on right side a portion of leaf cut ready to make cocoon, on left side a portion cut and removed;
b, Larva (x 16) ;
c, Larva in leaf-case ready to make cocoon ;
d, completed cocoon ;
e, Cocoon opened, showing pupa ;
f, Pupa;
g, Moth. All magnified (x 16).

LIFE-HISTORIES OF INDIAN INSECTS. MICROLEPIDOPTERA.

V. HELIOZELIDÆ, HELIODINIDÆ, GLYPHIPTERYGIDÆ, BLASTOBASIDÆ AND HYPONOMEUTIDÆ.

BY

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(Received for publication on 27th June 1919.)

HELIOZELIDÆ.

ANTISPILA ARGOSTOMA, MEYR. (PLATE XXVII.)

Antispila argostoma, Meyr., Exot. Micr., II, 8 (Oct. 1916)(1).

Bred at Pusa "in August from larva mining blotch in leaf of *Vitis trifolia* (*Fletcher*); cocoon sent is oval, similar in construction to preceding [*aristarcha*] but larger, greyish-ochreous, spinous filaments only 1-14 length of cocoon "(1).

This species is common at Pusa during the Rains (July-September), and has been bred from larvæ mining leaves of *Vitis trifolia*. Although it may be reared in numbers, the adult insect has never been noticed under natural conditions. The larva mines a portion of the leaf, leaving intact the two membranous epidermal layers. It commences the mine from any place on the surface. While the larva is young it causes a narrow zigzag yellowish-white line as it mines on and in the middle of this line a streak of black excrement is left along its whole length. The mine becomes gradually broader and then develops rather abruptly into a large yellowish-white blotch and the quantity of excrement is also large, appearing like a large black patch in the middle of the mine. When the larva is full-grown, it lines an oval portion of the mine near the edge with brown silk and converts it into a flat

roughly oval case which is then cut off entirely from the leaf, leaving an oval hole in its place. The case is composed of two thin slightly concave pieces joined together on their concave faces. The margins are loosely fastened with silk. After cutting out this case, the larva behaves exactly like a case-bearer such as *Macraeola inquisitrix* and moves about, carrying the case and thrusting its head out at either end indifferently. As the larva is devoid of legs, it effects locomotion in a peculiar way by means of silk; the head is thrust out of the case and silk is applied to the surface on which it moves, thus securing the case; next, silk is stretched from the margin of the case to some point ahead and the case is drawn forward and fastened there; thus the larva moves about in its case even on vertical surfaces. After some time the case is fastened to a suitable place, usually by two or more silken threads of which one end is attached to the margin of the case and the other to the supporting surface. In confinement the cases were attached to the leaves lying on the bottom of the cage, or to the walls or top of the cage. After securing the case to a suitable place, the larva spins a brown oval cocoon inside it and pupates in that. The cocoon is formed in the central part of the case, its longer axis lengthwise. When the cocoon is formed, the central portions of the two leaf epiderms forming the case are drawn much closer together, with the result that a longitudinal ridge appears at the middle of each.

In some of these cases, there are a few short brown processes radiating from the margin (figure *d*); these are strands of silk which are applied to the margins of the case to connect it to the leaf while it is being cut out by the larva.

The full-grown larva (figure *b*) is about 4 mm. long by about 0·75 mm. broad across middle, flattened, tapering posteriorly, segments distinct and rather protuberant laterally, pale yellow with a greenish tinge, somewhat shiny and transparent; head smaller than prothorax, red-brown; prothorax wholly dark brown; thin hairs scattered on head and body; legs and prolegs absent.

The pupa (figure *f*) is about 2·25 to 2·5 mm. long, dorsally rather convex, narrowed towards extremities, brown (darkening before emergence of adult); a deep constriction behind head, differentiating this from thorax; tip of wing case reaching penultimate segment and posterior legs reaching or even slightly exceeding anal extremity; four abdominal spiracles on each side are white tubular projections. Before emergence of the moth, the pupa wriggles out to some extent through one end of the cocoon, the empty pupa-case remaining protruding from the cocoon. The pupal period is about six days. (Pusa Insectary Cage-slips 1431, 1463.)

ANTISPILA ARISTARCHA, MEYR.

Antispila aristarcha, Meyr., Exot. Micr., II, 8 (Oct. 1916)(1).

Bred at Karwar, North Kanara, " in August from larvæ mining transparent blotches in leaf of *Vitis* sp. (many larvæ in a leaf) (*Maxwell*). Cocoons sent by Mr. Maxwell are apparently formed of two rather irregular grey discs of leaf-cuticle joined at the edges, with several projecting spinous filaments at each end, which are probably natural projections of the leaf, about $\frac{1}{3}$ length of cocoon "(1).

HELIODINIDÆ.

STATHMOPODA HEMITORNA, MEYR.

Stathmopoda hemitorna, Meyr., Exot. Micr., I, 97 (1913)(1) ; *l.c.*, II, 62 (1917)(2).

Originally described from Siruguppa (Bellary), this species has since been recorded from Dharwar and bred at Coimbatore " from refuse collected in fork of tamarind (*Tamarindus indica*) (Fletcher) ; probably therefore the larva feeds in the pods "(2). It seems more probable that the larvæ were feeding on the dead leaves collected in the fork of the tree.

STATHMOPODA THEORIS, MEYR.

Æoloscelis theoris, Meyr., B. J., XVII, 410-411 (1906)(1).

Stathmopoda theoris, Meyr., *t. c.* p. 983(2), T. L. S. (2) XIV, 286 (1911)(3), Entom. Mitteil. Suppl., III, p. 56 (1914)(4) ; Lefroy, Ind. Ins. Life, p. 537 (1909)(5) ; Imms and Chatterjee, Ind. For. Mem., III, 32, t. 7, f. 23 (1915)(6) ; Proc. Second Entl. Meeting, p. 96 (1917)(7).

Common throughout India and Ceylon(1) ; also recorded from Formosa(4).

Larva feeds in flower-heads of sunflower (*Helianthus*)(3,6).

Larva slender, black, naked, with five pairs of prolegs, head and prothoracic shield black ; found feeding in sunflower heads, the seeds apparently not eaten, but the dried remains of the flowers(5).

" We have reared . . . . . *Strathmopoda theoris*, Meyr., from lac received from Bhandara and Jubbulpore . . . . . we have not reared a sufficient number of examples to definitely prove that it is an undoubted enemy of lac, and not merely only accidentally associated with it "(6).

This species has been reared at Coimbatore on *cholam* ear-heads, from refuse found in the fork of a tamarind tree, and from palm-fibre chewed by *Oryctes rhinoceros* ; and at Pusa from sunflower heads, from a rotten peach-fruit, from ripe fallen *gular* (*Ficus glomerata*) fruit, from drying balsam leaves, from dry cotton and *Acacia arabica* leaves, and from cotton shoots badly affected by a mealy-bug. We have it also from Surat and from Dinanagar (Punjab).

The larva seems to be a feeder on dead vegetable matter, spinning together dead or drying leaves and nibbling irregular holes in them.

STATHMOPODA SYCOPHAGA, MEYR.

Stathmopoda sycophaga, Meyr., Exot. Micr., I, 87-88 (1913)(1).

Reared at Pusa in May from larvæ in figs of *Ficus glomerata*(1).

Larvæ were found at Pusa on 14th April 1907 in figs of *Ficus glomerata* and were described as about 15 mm. long, cylindrical, slightly tapering towards either extremity; head and prothoracic shield brown, shiny; body-segments distinct, pale yellow, segments with a brownish tinge and with small scattered hairs; five pairs of prolegs. The larva bores into the figs and eats the florets. Pupation takes place inside the fig in a white cocoon in which the pupa-case remains on the emergence of the moth. The larvæ are parasitized by two Dipterous and three small Hymenopterous flies. The moths from these larvæ emerged between 29th April and 11th May 1907. (Pusa Insectary Cage-slip 529.)

STATHMOPODA BASIPLECTRA, MEYR.

Stathmopoda basiplectra, Meyr., Exot. Micr., I, 97 (1913)(1); Imms and Chatterjee, Ind. For. Mem. (Zool.), III, 32-33 (1915)(2).

Described from Ranipur, in the Hardwar District, where it was bred in April from "larva burrowing in seeds of *Albizzia lebbek* (Leguminosæ) in December, afterwards eating a hole through the wall of pod to emerge "(1).

"We have reared . . . . . *S. basiplectra*, Meyr., from lac obtained from Ranipur in the Siwalik forests . . . . . There seems to be little doubt that its larva devours the lac, but it does not appear in sufficient abundance to warrant its being regarded as a serious enemy. We have bred out the insect from April to July and there is a specimen in the Forest Research Institute Collection that was obtained in November and bred out from lac by Mr. V. S. Iyer "(2).

STATHMOPODA PRÆALBATA, MEYR.

Stathmopoda præalbata, Meyr., Exot. Micr., I, 337 (1915)(1).

This species has been bred at Pusa in February-March 1916 from fallen banyan (*Ficus bengalensis*) fruits collected in November 1915. We also have it from Chapra.

STATHMOPODA SYCASTIS, MEYR. (PLATE XXVIII, FIG. 1.)

Stathmopoda sycastis, Meyr., Exot. Micr., II, 62 (1917)(1); Proc. Second Entl. Meeting, p. 251 (1917)(2).

Bred in July at Tarnab, Peshawar District, from larva feeding in figs of *Ficus carica* (*Fletcher*)(1, 2).

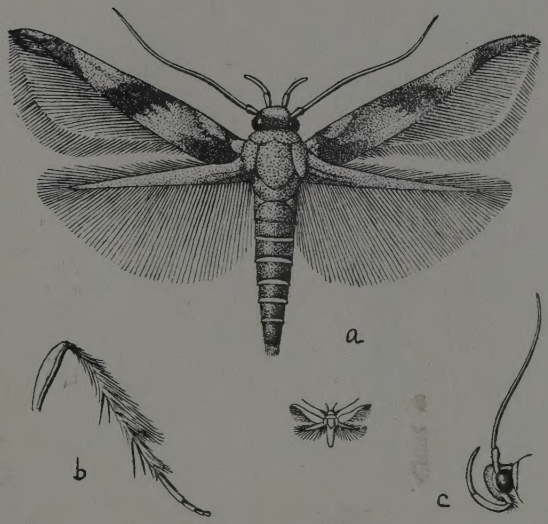
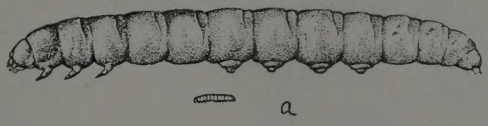


Fig. 1. *Stathmopoda sycastis*:—*a*, Moth, natural size and magnified ; *b*, hind leg of moth, magnified; *c*, side-view of head of moth, magnified.



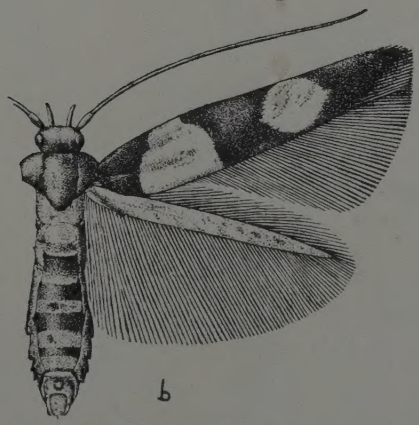


Fig. 2. *Stathmopoda ovigera*:—*a*, Larva, natural size and magnified (x 12) ; from a spirit specimen ; *b*, moth, magnified (x 12).

ŒDEMATOPODA CLERODENDRONELLA.

A larva was found boring in a ripe fig on 3rd June 1916. It pupated before 14th June in a white silken cocoon spun in a corner of the box and the moth emerged at Pusa on 19th July.

This caterpillar is well-known in the Peshawar District, so much so that the local people are rather chary of eating figs on account of the caterpillars in them.

STATHMOPODA OVIGERA, MEYR. (PLATE XXVIII, FIG. 2.)

Stathmopoda ovigera, Meyr., Exot. Micr., I, 93 (1913)([1]).

This species was originally described from Puttalam (Ceylon). It has since been bred from blackish larvæ found in fluffy masses of *Paimarisa* sp. on *Ficus glomerata* at Coimbatore in December 1916. We have moths from Peshawar also, so that it is evidently widely distributed in the Plains of India and Ceylon.

STATHMOPODA ADULATRIX, MEYR.

Stathmopoda adulatrix, Meyr., Exot. Micr., II, 61 (1917)([1]).

Bred in September in Almora [illegible] on *Viburnum foetidum longifolia* (*Beeson*)([1]).

EXPLANATION OF PLATE XXIX.

ŒDEMATOPODA CLERODENDRONELLA.

Fig. 1. Top-shoot of plant of *Clerodendron infortunatum* spun up by larva.
„ 2. Larva, natural size and magnified.
„ 3. Pupa, „ „ „
„ 4. Moth, resting attitude, from above, natural size and magnified.
„ 5 Moth, wings expanded, natural size and magnified.

ŒDEMATOPODA VENUSTA, MEYR.

Œdematopoda venusta, Meyr., Exot. Micr., I, 95 (1913)([1]).

Described from Pusa([1]), where it was bred in June 1907 from a larva from colonies of *Tachardia albizziæ* on [illegible].

ŒDEMATOPODA CYPRIS, MEYR.

Œdematopoda cypris, Meyr., B. J., XVI, 603 (1905)([1]).

Reared in December at Kandy from colony of Lac Coccid, *Tachardia albizziæ*, on *Theobroma cacao*.

ŒDEMATOPODA FLAMMIFERA, MEYR.

Œdematopoda flammifera, Meyr., Exot. Micr., I, 338 (1915)([1]).

Described from Pusa([1]), where it was reared in June 1907 from a larva in a mango shoot. This is the only specimen [illegible] so far.

ŒDEMATOPODA CLERODENDRONELLA, STT. (PLATE XXIX

Atkinsonia clerodendronella, Staint., T. E. S. (n.s.), V, 125 (1870)([2]).

Œdematopoda clerodendronella, Wlsm., T. E. S., 1889, t. 6, f. 7-9; Lefroy, Ind. Ins. Life, p. 537 (1909)([3]).

Originally described from Calcutta([1]). Found commonly at Pusa and Chapra in Bihar.

EXPLANATION OF PLATE XXIX.

(HEMATOPODA CLERODENDRONELLA.)

Fig. 1. Top-shoot of plant of *Clerodendron infortunatum* eaten up by larva.
" 2. Larva, natural size and magnified.
" 3. Pupa, " " "
" 4. Moth, resting attitude, from above, natural size and magnified.
" 5. Moth, wings expanded, natural size and magnified.

A larva was found boring in a ripe fig on 3rd June 1916. It pupated before 14th June in a white silken cocoon spun in a corner of the box and the moth emerged at Pusa on 19th July.

This caterpillar is well-known in the Peshawar District, so much so that the local people are rather chary of eating figs on account of the caterpillars in them.

STATHMOPODA OVIGERA, MEYR. (PLATE XXVIII, FIG. 2.)

Stathmopoda ovigera, Meyr., Exot. Micr., I, 93 (1913)(1).

This species was originally described from Puttalam (Ceylon)(1). It has since been bred from blackish larvæ found in fluffy masses of *Pulvinaria* sp. on *Ficus glomerata* at Coimbatore in December 1916. We have moths from Peshawar also, so that it is evidently widely distributed in the Plains of India and Ceylon.

STATHMOPODA ADULATRIX, MEYR.

Stathmopoda adulatrix, Meyr., Exot. Micr., II, 61 (1917)(1).

Bred in September in Almora (6,000 feet) from twigs of *Pinus longifolia* (*Beeson*)(1).

ŒDEMATOPODA VENUSTA, MEYR.

Œdematopoda venusta, Meyr., Exot. Micr., I, 97 (1913)(1).

Described from Jabalpur in the Central Provinces, where it was bred from colonies of *Tachardia lacca*(1).

ŒDEMATOPODA CYPRIS, MEYR.

Œdematopoda cypris, Meyr., B. J., XVI, 603 (1905)(1).

Reared in December at Kandy from colony of Lac Coccid, *Tachardia albizziæ*, on *Theobroma cacao*.

ŒDEMATOPODA FLAMMIFERA, MEYR.

Œdematopoda flammifera, Meyr., Exot. Micr., I, 338 (1915)(1).

Described from Pusa(1), where it was reared in June 1907 from a larva in a mango shoot. This is the only specimen known so far.

ŒDEMATOPODA CLERODENDRONELLA, STT. (PLATE XXIX.)

Atkinsonia clerodendronella, Staint., T. E. S. (n.s.), V, 125 (1859)(1).

Œdematopoda clerodendronella, Wlsm., T. E. S., 1889, t. 6, f. 7(2); Lefroy, Ind. Ins. Life, p. 537 (1909)(3).

Originally described from Calcutta(1). Found commonly at Pusa and Chapra in Bihar.

Larva brownish, with a few short hairs; it webs up the top of a shoot and pupates in a thin silk cocoon in the bunch of leaves, the moth emerging inside the cocoon. Feeds on *Clerodendron infortunatum* and *Anisomeles ovata*[3].

The larva is about 10 mm. long. It folds up a leaf or webs up the tender top-leaves by means of white silken threads, living in shelter and eating holes in the leaves from within. Pupation takes place in the folded leaves or amongst the flower-heads, when these are available.

The adults occur at Pusa in March, June and July-August.

ERETMOCERA IMPACTELLA, WLK. (PLATE XXX.)

Gelechia ? impactella, Wlk., Cat., XXIX, 637[1].

Eretmocera impactella, Moore, Lep. Ceylon, III, 514, t. 209, f. 10 (1887)[2], Wlsm., T. E. S., 1889, pp. 34-35, 39, t. 6, f. 18[3]; Hmpsn., Faun. Ind., Moths, I, 208, f. 135[4]; Lefroy, Ind. Ins. Life, p. 537 (1909)[5]; Fletcher, S. Ind. Ins., p. 461, f. 337 (1914)[6]; Proc. Second. Entl. Meeting, p. 296 (1917)[7].

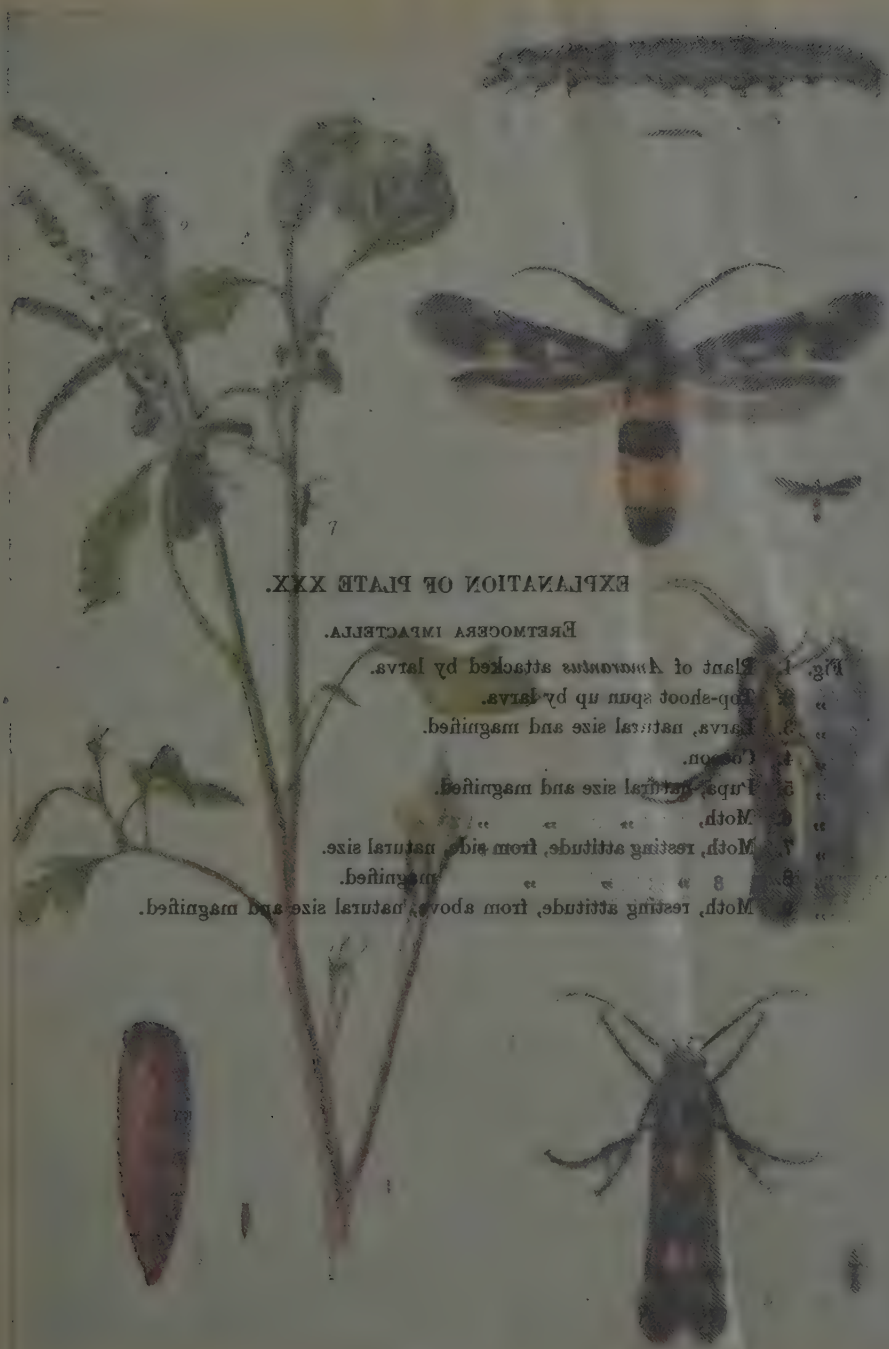
Common throughout the Plains of India, Burma and Ceylon. Also recorded from Singapore and Formosa.

The larva feeds on *Amarantus*[6, 7] and is sometimes a minor pest, webbing up the heads of the plants. It remains more or less hidden in the folds of the leaves which are spun together with white silken threads. It walks very fast and, when walking, a small hump is produced at the hind end of the body. When disturbed it is able to make small springs.

The larva is about 10 mm. long, moderately stout, cylindrical, tapering slightly towards either extremity, brownish-grey or brownish-yellow with a broad submedian darkish stripe; head bilobed, with an inverted Y-shaped mark in front, posterior external part of each lobe black, rest of head speckled with black, with long white hairs; prothoracic shield dark, broadly divided medially; tubercles black, bearing several divergent longish white hairs, which give the larva rather a hairy appearance; prolegs fully developed with crochets arranged in a circle.

Pupation takes place in a cocoon of white silk, very fine and cottony, the cocoon being spun usually amongst the leaves. The larva rests for about a day inside this cocoon and then casts off the last larval skin which remains attached to the pupa, enclosing its anal segments.

The pupa is about 6 mm. long, uniform brown, and tapers prominently posteriorly; wings and legs folded ventrally, their tip about reaching the eighth abdominal segment. There seem to be no cremastral hooks on the



EXPLANATION OF PLATE XXX.

BRETMOCERA IMPACTELLA.

Fig. 1. Plant of *Anacamptis* attacked by larva.
» 2. Top-shoot spun up by larva.
» 3. Larva, natural size and magnified.
» 4. Cocoon.
» 5. Pupa, natural size and magnified.
» 6. Moth, » » »
» 7. Moth, resting attitude, from side, natural size.
» 8. » » » magnified.
» 9. Moth, resting attitude, from above, natural size and magnified.

Larva brownish, with a few short hairs; it webs up the top of a shoot and pupates in a thin silk cocoon in the bunch of leaves, the moth emerging inside the cocoon. Feeds on *Clerodendron infortunatum* and *Anisomeles ovata*[3].

The larva is about 10 mm. long. It folds up a leaf or webs up the tender top-leaves by means of white silken threads, living in shelter and eating holes in the leaves from within. Pupation takes place in the folded leaves or amongst the flower-heads, when these are available.

The adults occur at Pusa in March, June and July-August.

ERETMOCERA IMPACTELLA, WLK. (PLATE XXX.)

Gelechia ? impactella, Wlk., Cat., XXIX, 637[1].

Eretmocera impactella, Moore, Lep. Ceylon, III, 514, t. 209, f. 10 (1887)[2], Wlsm., T. E. S., 1889, pp. 34-35, 39, t. 6, f. 18[3]; Hmpsn., Faun. Ind., Moths, I, 208, f. 135[4]; Lefroy, Ind. Ins. Life, p. 537 (1909)[5]; Fletcher, S. Ind. Ins., p. 461, f. 337 (1914)[6]; Proc. Second. Entl. Meeting, p. 296 (1917)[7].

Common among the hills of India, Burma and Ceylon. Also recorded from Malaya and Formosa.

The larva feeds on *Amaranthus*[ ] and is sometimes a minor pest, webbing up the shoots of the plants. It remains more or less hidden in the folds of the leaves which are spun together with white silken threads. It walks very fast and, when walking, a small hump is produced at the hind end of the body. When disturbed it is able to make small springs.

The larva is about 10 ,, ,, long, moderately stout, cylindrical, tapering slightly towards either extremity, brownish-grey or brownish-yellow with a broad submedian darkish stripe; head bilobed, with an inverted Y-shaped mark in front, posterior external part of each lobe black, rest of head speckled with black, with long white hairs; prothoracic shield dark, broadly divided medially; tubercles black, bearing several divergent longish white hairs, which give the larva rather a hairy appearance; prolegs fully developed with crochets arranged in a circle.

Pupation takes place in a cocoon of white silk, very fine and cottony, the cocoon being spun usually amongst the leaves. The larva rests for about a day inside this cocoon and then casts off the last larval skin which remains attached to the pupa, enclosing its anal segments.

The pupa is about 6 mm. long, uniform brown, and tapers prominently posteriorly; wings and legs folded ventrally, their tip about reaching the eighth abdominal segment. There seem to be no cremastral hooks on the

EXPLANATION OF PLATE XXX.

ERETMOCERA IMPACTELLA.

Fig. 1. Plant of *Amarantus* attacked by larva.
2. Top-shoot spun up by larva.
3. Larva, natural size and magnified.
4. Cocoon.
5. Pupa, natural size and magnified.
6. Moth.
7. Moth, resting attitude, from side, natural size.
8. ,, ,, magnified.
9. Moth, resting attitude, from above, natural size and magnified.

ERETMOCERA IMPACTELLA.

anal segment, but all over the body and head there are scattered small stiff hairs with curved tips which are hooked into the fibres of the cocoon. On emergence of the moth, the empty pupa-case is left within the cocoon. (Pusa Insectary Cage-slip 702.)

The life-cycle is between three and four weeks. A fertilized female confined with living *Amarantus* plants on 30th May 1911 died on 2nd June, after laying eggs which were not observed. Two young larvæ were found on 8th June and of these one spun up on 17th June and the moth emerged on 27th June 1911.

We have this from Coimbatore, Mangalore, Sidapur, Tranquebar, Surat, Nadiad, Bassein Fort, Multan, Peshawar, Abbottabad, Pusa, and Upper and Lower Burma. The moth varies considerably in markings, the yellow spots on the forewing being sometimes obsolescent and both wings suffused with blackish.

GLYPHIPTERYGIDÆ.

HILAROGRAPHA CAMINODES, MEYR.

Hilarographa caminodes, Meyr., B. J., XVI, 610 (1905)(1); Green, Peradeniya Circ., II, 17, p. 250 [not named](2); Fletcher, S. Ind. Ins., p. 464 (1914)(3); Proc. Second Entl. Meeting, p. 37 (1917)(4).

Described from Ceylon (Pundaluoya, Gammaduwa and Rangella); larva a pest on cardamom(1). We have it from Gammaduwa.

Larva bores in the root of cultivated cardamoms and in wild Zingiberaceous plants. The eggs are laid on the exposed upper part of the bulb(2 3).

IMMA MYLIAS, MEYR.

Imma mylias, Meyr., T. E. S., 1906, 173 (1906)(1); Exot. Micr., II, 191 (1918)(2).

Originally described from Ceylon(1), this species has been found at Coimbatore also.

An example received from Mr. Fletcher, said to have been "bred from tamarind bark." Pupa with four segments fixed(2).

PHYCODES MINOR, MO.

Phycodes minor, Moore, P. Z. S., 1881, 378(1), Lep. Atk., ii, 152 (1882)(2); Cotes & Swinhoe, Cat. Moths Ind., p. 701 (1889(3); Meyr., Rec. Ind. Mus., V, 226(4); Proc. Second Entl. Meeting, p. 251(5).

Phycodes lucasseni, Snell., Tijds. voor Ent., XLIV, 74, t. 5, f. 1 (1901)(6).

Phycodes cymineuta, Meyr., B. J., XIX, 424-425 (1909)(7).

Recorded from N. W. India(2), Kulu(3), Bengal (Rajmahal)(4) and Karagola(2), from Haputale in Ceylon(6), and from Java(6). Common at Pusa in Bihar and apparently throughout the Plains of India. We have it from Peshawar, Hazara, Lahore, Poona, Pusa, Gauhati, Nowgong, and Minbu (Lower Burma).

Larva on *Ficus* spp. The moth has been reared at Lahore from pupa found in leaf of *Ficus carica* and at Pusa from larvæ rolling leaves of *Ficus heterophylla*.

The larva is about 15 mm. long and 2 mm. broad across the metathoracic region, whence it tapers slightly in both directions, cylindrical, segments fairly distinct, light green ; head flattened, yellow, shiny, with a black lateral longitudinal marking ; prothorax with a more or less shiny shield, a portion between head and shield greenish-white ; mesothorax and metathorax dark smoke-colour, this colour extending in a less dark form on the ventral side ; legs black ; abdominal segments with dark smoky submedian patches forming an interrupted stripe, and with a similar less distinct spiracular stripe, white patches alternating with the smoky ones ; a white lateral stripe ; primary hairs white ; spiracles small, black, round ; five pairs of equally developed prolegs which appear like slender rod-like protuberances from the abdominal folds, crochets on prolegs arranged in a circle.

Pupation takes place in a white silken cocoon formed amongst rolled leaves or on a single leaf which is rolled into a boat-shape. A large quantity of silk is used to make the cocoon which consists of several layers of thin papery structure. Pupa brown, cylindrical, tapering posteriorly, and with a row of small posteriorly-directed spines on the anterior part of the dorsal surface of the abdominal segments. Before emergence of the moth, the pupa wriggles out through one end of the cocoon to some extent. A Tachinid parasite has been reared. From larvæ collected at Pusa on 25th September the moths emerged between 8th and 12th October 1917. (Pusa Insectary Cage-slip 1711.)

PHYCODES RADIATA, OCHS.

Chimæra radiata, Ochs., Schmett. Europ., II, 5-6 (1808)(1).

Phycodes hirudinicornis, Guenee, Noct., II, 389, 1249, t. 13, f. 5 (1852)(2).

Tegna hyblæella, Wlk., Cat., XXXV, 1810 (1866)(3) ; Forsayeth, T. E. S., 1884, 379, 413, t. 14, f. 10(4).

Phycodes radiata, Lefroy, Ind. Ins. Life, p. 538, t. 52, ff. 7-10 (1909)(5) ; Fletcher, S. Ind. Ins., pp. 463-464, f. 339 (1914)(6) ; Proc. Second Entl. Meeting, p. 251 (1917)(7).

Common throughout India (from Nepal and Dharmsala to Bombay and Madras) and Ceylon. We have it from Coimbatore (larva on *Ficus*), Hagari (larva on leaves of *Ficus tisela*), Pusa (larva on leaves of *Ficus religiosa* and *F. glomerata*), Kulu, Gurdaspur, Garhshankar (Punjab) (larva on *Ficus carica*) and from Peshawar (larva on *Ficus carica*).

Larva about 20 mm. long, moderately stout, rather flattened, smooth; with scattered short hairs, in colour dull yellowish-white with a broad interrupted dark stripe along the side, head and prothoracic shield red-brown, a broad dark band transversely across the back of meso- and meta-thoracic segments. The caterpillar rolls leaves of *Ficus*. Pupa red-brown, in a tough paper-like cocoon, occasionally spun on a leaf but more usually in a crack of the bark or similar situation; pupal period about 15 days([6]).

The egg has not been observed but is probably laid on tender fig leaves. The larvæ roll tender leaves, either folding over the edge of a leaf or tying one leaf over another, and eat the epidermis from within the roll.

A young larva, about 10 mm. long, is rather flattened; head flattened, yellow-brown, smaller than prothorax; prothorax smaller than mesothorax, wholly dirty dark-brown or blackish, with a shiny black shield; mesothorax slightly smaller than metathorax, dirty dark-brown, anteriorly banded with yellow; abdominal segments yellow; legs black; five pairs of prolegs yellow.

The full-grown larva is about 22 mm. long, rather flattened; head shiny yellow-brown, flattened, smaller than prothorax; prothoracic shield large, shiny, dark brown; prothorax laterally whitish, ventrally blackish; mesothorax and metathorax blackish dorsally, laterally and ventrally whitish; a whitish band between mesothorax and metathorax; first abdominal segment yellowish with a faint black marking on lateral margin of submedian region; remaining segments greyish-white; submedian portions of second to sixth abdominal segments black; upper part of seventh abdominal segment black and of eighth abdominal segment yellow with a pair of black points; ninth abdominal segment yellowish anteriorly and blackish posteriorly; a few long white hairs on each segment; spiracles oval, rimmed with black.

Pupation takes place within a flattened, oval, disc-shaped, dirty brown cocoon of rather papery texture, about 15 mm. long and 7 mm. broad. In warm weather the cocoon may be formed within folded leaves but in winter it is always formed on the trunk of the tree. Before emergence of the moth, the pupa wriggles out of the cocoon for about half its length.

The moth is diurnal in habit and may be seen sucking nectar from flowers during the daytime.

The larvæ occur at Pusa from April to November. Hibernation apparently takes place in the pupal, and possibly also in the larval, state. From cocoons collected during the winter moths emerged in March-May. (Pusa Insectary Cage-slip 255.)

SIMAETHIS OPHIOSEMA, LOWER.

Simaethis ophiosema, Low., Trans. Royal Soc. S. Austral., XX, 167 (1896)(1); Meyr., Cat. Glyphipt., p. 35 (1913)(2).

? *Simaethis regularis*, Pag., Jahrh. Nass. Verh. Naturk., XXXVII, 288 (1884)(3).

Originally described from Australia(1), *S. ophiosema* has also been recorded from China(2), the Moluccas(2) and India(2).

This species has been bred at Pusa from a larva found on 6th October 1912, letting itself down by a silken thread from a bamboo overhanging the road. The larva was about 13 mm. long, cylindrical, tapering slightly towards either extremity, head brown, body uniformly light yellow spotted with black like the larva of *Antigastra catalaunalis*. The larva formed an elongated white cocoon of white silk lining a folded bamboo leaf on 7th October, pupated on 8th and emerged on 13th October. (Pusa Insectary Cage-slip 968.)

We have this insect from Srinagar (Kashmir), Pusa, Coimbatore and Pollibetta (South Coorg). At Pusa the moths occur from October to January.

SIMAETHIS ORTHOGONA, MEYR.

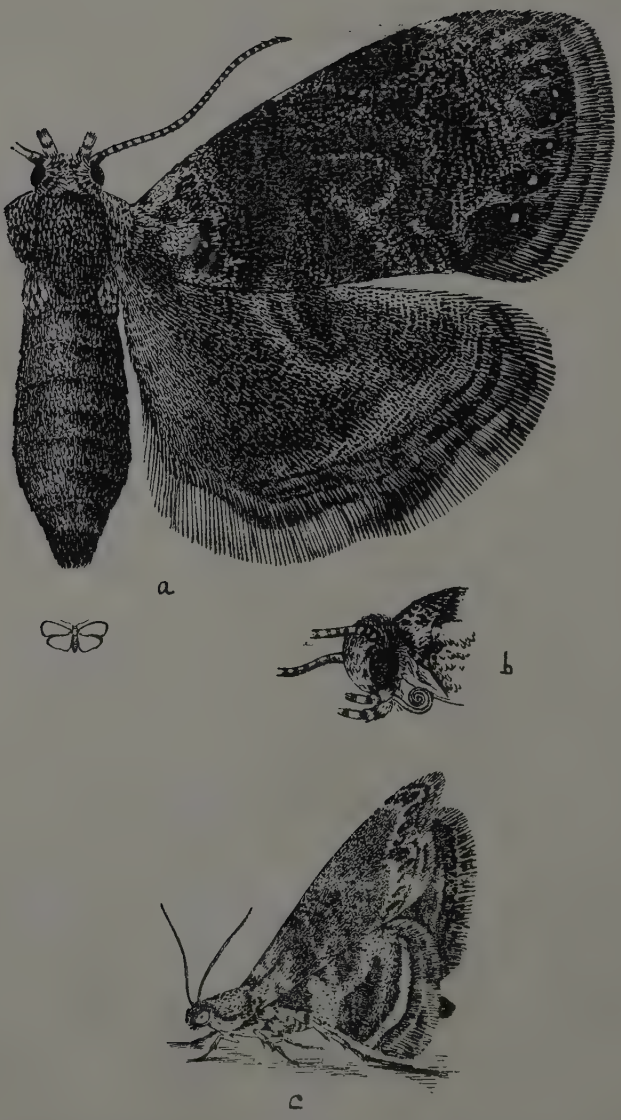
Simaethis orthogona, Meyr., T. E. S., 1886, 287-288(1), Proc. Linn. Soc. N. S. W., XXXII, 114 (1907)(2), Rec. Ind. Mus., V, 226(3), Cat. Glyphipt., p. 35 (1913)(4); Lefroy, Ind. Ins. Life, p. 538 (1909)(5).

Simaethis inscriptana, Snell., Tijds. voor Ent., XVIII, 76, t. 6, f. 6 [♀] (1875) [*nec* ♂](6).

Recorded from India, Burma and Ceylon. Also in New Guinea and Celebes. We have it from Pusa, Chapra, Nadiad and the Shevaroys.

Larva green with a brown head and a row of black tubercles on each side of the body; it feeds on the leaves of *Psoralea corylifolia*, pupating under a slender white cocoon on the leaf(5).

There appears to be some error in the above description. The larvæ have been bred on two occasions at Pusa by A. Mujtaba and the foodplant is recorded as *sahora* or *sahra* (*Streblus* sp.), whilst the larvæ were described as 7 to 8 mm. long, tapering posteriorly, dark grey or honey yellow, head reddish-yellow, segments with numerous black dots from which white hairs arise. Pupa 5 mm. long, light-brown or lemon-yellow, wriggling half-way out



Brenthia coronigera:—*a*, Moth, natural size and magnified (x 16) ; *b*, side-view of head of moth, magnified ; *c*, moth, resting attitude, magnified (x 10).

of the cocoon on emergence of moth. From larvæ taken on 13th July 1906, moths emerged on 21st and 23rd July, and a larva taken on 9th August 1907 formed its cocoon the next day, pupated on 11th August and emerged on 18th August. (A. Mujtaba's Cage-slips 6 and 31.)

SIMAETHIS ÆGYPTIACA, ZELLER.

Simaethis ægyptiaca, Zell., Stett. Ent. Zeit, XXVIII, 366 (1867)(1), T. E. S. (3), V, 461, t. 24, f. 1 (1868)(2); Meyr., Cat. Glyphipt., p. 36 (1913)(3); Rebel, Lep. aus. Südarab. und Sokotra, p. 89 (1907)(4).

This species was originally described from Egypt(1, 3) and has since been recorded from the Transvaal(3), India(3) and Sokotra(4).

We have it from Pusa, Chapra and Simla. At Pusa it has been reared from larvæ webbing up tender leaves of *Ficus glomerata*.

SIMAETHIS FABRICIANA, LINN.

Tortrix fabriciana, Linn., Syst. Nat. (xii) 880(1).

Simaethis fabriciana, Meyr., Rec. Ind. Mus., V, 226(2), Cat. Glyphipt., p. 36 (1913)(3), Handbk., p. 707(4).

Recorded from Europe, Asia Minor, Madeira, Canada and British Columbia. Within our limits from Simla and Kashmir. We have it from Dungagali (8,000 feet), Hazara District (May 1915).

"Larva ochreous-whitish, spots pale fuscous; head and plate of 2 pale fuscous; in a slight web on *Urtica* and *Parietaria*"(4).

BRENTHIA CORONIGERA, MEYR. (PLATE XXXI.)

Brenthia coronigera, Meyr., Exot. Micr., II, 194 (1918)(1).

Bred at Pusa in February from a larva feeding on leaves of *Cordia myxa* (Boraginaceæ)(1).

This species has been bred at Pusa from larvæ feeding on leaves of *Cordia myxa* in February 1917 and 1919 and January 1917. The larva lives on the surface of a leaf under cover of a silken webbing to which stick the black pellets of frass. It gnaws the leaf-tissue in characteristic patches, leaving the other epidermis entire. The portion thus gnawed is covered with the silken webbing.

The larva is about 6 mm. long and about 1 mm. broad across the thoracic region, thence slightly tapering posteriorly, pale yellow with a green tinge; head pale yellow; primary hairs short, arising from tubercles which appear as black spots; some black spots on the head also. Pupation takes place within a cocoon of pure white silken threads and the moths emerge at Pusa during the second half of February. (Pusa Insectary Cage-slip 1516.)

The moths strut about jerkily with the hindwings carried nearly at a right angle with the forewings, so that the wings form a sort of cone when seen from behind the insect. The eyes are pale green. This attitude is characteristic of other species of this genus.

CHOREUTIS BJERKANDRELLA, THNB.

. . . . . *bjerkandrella*, Thunb., Diss. Ent., I, 36, t. 3, ff. 23-24 (1784)([1]).

Choreutis bjerkandrella, Meyr., Handbk., p. 706 (1895)([2]); Spuler, Schmett. Eur., II, 297-298([3]); Meyr., Cat. Glyphipt., p. 39 (1913) [synonymy]([4]).

A cosmopolitan species known from Europe, North, Central and South America, North and South Africa, Western Asia, India, Australia and New Zealand.

Larva described by Spuler; on leaves of *Carlina*, *Inula*, *Carduus*, etc.([3]).

Larva green, yellower laterally; spots black; head brown; on *Carduus*, *Inula*, *Eryngium*, etc.([2]).

Larvæ were collected at Pusa on *kukronda* (? *Blumea balsamifera*) on 14th January 1910, the moths emerging between 14th January and 5th February. The larva was described as about 7 to 8 mm. long, cylindrical, slightly tapering towards extremities, uniform green; head yellowish-green; hairs arising from small black points, making the larva look minutely spotted under a lens; five pairs of equally developed prolegs. The larva rolls a single leaf, or only the apical portion, or binds one leaf over another or binds together the top leaves; it lives concealed and eats only the epidermis or the epidermis along with the mesophyll substance of the leaf, leaving one epidermal layer entire, so that when the leaf is unrolled the portion eaten appears as a transparent brown spot. Pupation takes place in concealment also in a cocoon of pure white silk lining a rolled-up leaf. The pupa is about 4 to 5 mm. long, cylindrical, tapering posteriorly, dark-coloured, the dorsal side of the anal segment produced into a short thick recurved hook-like process. The pupa wriggles out of the cocoon before the moth emerges. (Pusa Insectary Cage-slip 816.)

The moth is plentiful at Pusa in February and March and occurs less commonly in April and June. We have it from Pusa, Parachinar and Simla.

BLASTOBASIDÆ.

BLASTOBASIS SPERMOLOGA, MEYR.

Blastobasis spermologa, Meyr., Exot. Micr., I, 597 (June 1916)([1]).

Described from Ceylon (Maskeliya, Madulsima and Undugoda), from the Wainaad in S. India, and from S. China.

Bred in the Wainaad from tea-seed and at Port Darwin, North Australia, from dried smoked garlic imported from Hongkong(1).

We have this from Pusa, where it was bred in January 1916 from larva in fallen *gular* (*Ficus glomerata*) fruits.

BLASTOBASIS DECOLOR, MEYR.

Blastobasis decolor, Meyr., B. J., XVIII, 150-151 (1907)(1), Exot. Micr., I, 596 (1916)(2).

Originally described from Puttalam in Ceylon(1). Bred at Coimbatore in October from refuse in fork of tamarind tree(2), and at Pusa in July 1914 from larva in ripe fallen *gular* (*Ficus glomerata*) fruit.

BLASTOBASIS CRASSIFICA, MEYR.

Blastobasis crassifica, Meyr., Exot. Micr., I, 595-596 (June 1916)(1).

Described from Madulsima and Pusa(1). We have it from Pusa and Coimbatore.

Bred at Pusa in March from pods of *Crotalaria juncea*(1). Larvæ of this genus appear usually to feed on seeds and dry refuse rather indiscriminately without being confined to particular plants(1).

BLASTOBASIS TRANSCRIPTA, MEYR.

Blastobasis transcripta, Meyr., Exot. Micr., II, 158 (1918)(1).

"Bred at Almora, 6,000 feet, from twigs of *Pinus longifolia* (*Beeson*). Probably the larva feeds on refuse or in the cones"(1).

This species was bred at Dehra Dun by Mr. C. Beeson between 8th and 19th September 1915, from *chir* pine twigs attacked by a *Ripersia* scale and collected before 20th August 1915 at Almora (6,000 feet). Mr. Beeson considers that this insect is probably predaceous on the *Ripersia*.

EXINOTIS CATACHLORA, MEYR.

Exinotis catachlora, Meyr., Exot. Micr., I, 599 (June 1916)(1).

Described from Ceylon (Madulsima and Kalutara) and from Southern India (Nilgiris, 3,500 feet)(1).

This species has been bred at Pusa from larvæ in flower-heads of *gumma*, which was determined in 1905 as *Leonurus sibiricus* (Labiatæ) and in 1916 as *Leucas* sp. It is not clear whether these foodplants are really identical.

The larva remains hidden in the flower-heads, which show no external signs of injury, and eats the bases of the calyx tubes. It was described in 1906 as about 10 mm. long, cylindrical, uniform yellowish-white, body regularly corrugated ; head flat, reddish-black, shiny ; a prothoracic shield and five pairs of prolegs. (Insectary Cage-slip 240.)

The larva pupates within a calyx tube in a thin silvery-white silken cocoon. The pupa is about 5 to 6 mm. long by 1·75 mm. broad, shining brick-red ; head and prothorax bent downwards and thus not visible from above ; mesothorax longest ; metathorax nearly a third length of mesothorax ; eight abdominal segments very distinct ; wing-pad of anterior wing reaching base of eighth abdominal segment ; spiracles very prominent ; a small hair near spiracle on ninth abdominal (anal) segment. (C. S. Misra's Cage-slip of 26th January 1916.)

From larvæ collected on 9th December 1905, and which commenced to pupate on 11th December, moths emerged from 12th February to 10th April 1906, and from flower-heads collected on 26th January 1916 the moths emerged from 28th January to 25th February.

PROSINTIS FLORIVORA, MEYR.

Prosintis florivora, Meyr., Exot. Micr., I, 598 (June 1916)([1]).

Described from Madulsima and Pusa([1]).

Bred at Pusa in June from larva feeding in inflorescence of *Mangifera indica*([1]). Also reared at Pusa in August from larva on mango.

HOLCOCERA PULVEREA, MEYR.

Blastobasis pulverea, Meyr., B. J., XVIII, 151 (1907)([1]).

Hypatima doleropa, Meyr., *l.c.*([2]).

Hypatima pulverea, Meyr., *t.c.*, p. 638([3]) ; Lefroy, Ind. Ins. Life, p. 536 (1909)([4]) ; Misra, Pusa Bull. 28, p. 24 (1912)([5]) ; Imms and Chatterjee, Ind. For. Mem. (Zool.), III, 31-32, t. 7, f. 24 (1915)([6]).

Blastobasis thelymoipha, Imms and Chatterjee, *l.c.*, p. 32 (1915)([7]).

Originally described from " India (without further locality). Bred from larvæ feeding on colonies of *Tachardia lacca* "([1]) and from the Satpura Range, Khandesh, where it was found " parasitic in lac in company with the Noctuid *Eublemma amabilis* "([2]). The name *doleropa* is a synonym of *pulverea*, whilst *thelymorpha* (*thelymoipha* [sic !], Imms & Chatt.) is a *nomen nudum*.

The larva feeds not only on the insect on the tree but in the dry shellac on the cut stick([4] [5]).

" *Hypatima pulverea* is even more abundant than *Eublemma amabilis* and, in spite of its smaller size, is almost equally destructive. It is common

in all the forests from which we have obtained lac, with the exception of Hoshangabad. In the latter forests we have only bred out six examples from eleven separate consignments of lac. Its larva . . . . . is predaceous, devouring both the *Tachardia* and the lac incrustations and may be found in the lac during the greater part of the year. During the cooler months of December to March the moths are scarce and not often to be met with, but they are abundant during the whole season of April to November. Out of 1,714 moths bred out from lac obtained from various forests in both the United and Central Provinces, only 47 emerged during the months of December to March. The largest number that emerged during any one month was 492 during September.

" The larvæ of this insect are extremely destructive to stick lac and do not appear to be dependent upon living lac growing on the tree. The *Hypatima* larvæ may be found, and the moths bred out, three months after the lac has been removed from the trees . . . . . and it by no means follows that once the lac is gathered it may necessarily undergo no further destruction by insects, unless of course it is utilised very shortly after removal from the trees "(6).

We have this from Kumaon (larvæ on brood lac on *arhar*), Pusa (larvæ on lac-insects on *ber* tree and on stored lac), Pratapganj, Bengal (larva on lac), Berar, C. P. (larva on lac on *Butea frondosa*), Palamau (larvæ on lac on *Schleichera trijuga*), and Coimbatore (reared " from galls ").

The larva is about 10 mm. long and 2 mm. broad, cylindrical, slightly tapering posteriorly, dirty brown ; head bilobed, brown, with fairly long dark hairs, labrum and region immediately above it dark grey or black, frons with an inverted Y-shaped figure brown interiorly but on edges black or dark-grey ; prothoracic shield dark with a narrow medial brown stripe ; thoracic legs ringed with black ; spiracles oval, brown, ringed with black ; five pairs of well-developed prolegs, on which the crochets are arranged in circles.

When full-fed the larva pupates in a thin white silken cocoon in which it sometimes rests for ten days or more before pupating. The actual pupal period is about seven days. Pupa about 5 mm. long and 2 mm. broad with six cremastral hooks and with other hooks with recurved tips on abdominal segments, these hooks entangled in the silk of the cocoon. (Insectary Cage-slip No. 665.)

The genus *Hypatima*, Hb., in which this species has been placed hitherto in Indian literature, belongs to the Gelechiadæ. *Holcocera*, Clemens, is identical with *Hypatima*, H. S. (*nec* Hb.) ; see Walsingham, *Ent. Mo. Mag.* 1909, pp. 48-51.

SCYTHRIDIDÆ.

The early stages of no Indian species appear to have been observed. The larvæ of some of the European species are leaf-miners when young, sometimes gregariously, but when older spin leaves together and feed on the cuticle. (See Stainton, *Nat. Hist. Tin.*, XII, 70, t. 3.)

ELACHISTIDÆ.

Only a few Indian species of Elachistidæ have been described and the life-history of none is known. In Europe the larvæ mine the leaves of Gramineæ and Cyperaceæ chiefly. (See Stainton, *Nat. Hist. Tineina*, Vol. III.)

HYPONOMEUTIDÆ.

ARGYRESTHIA IOPLEURA, MEYR.

Argyresthia iopleura, Meyr., Exot. Micr., II, 187 (1918)(1).

Bred at Almora (6,000 feet) from twigs of *Pinus longifolia* (*Beeson*) probably feeding in the shoots(1).

PRAYS CITRI, MILL. (PLATE XXXII, FIG. 1.)

Acrolepia citri, Milliere, Pet. Nouv. Ent., V. 310 (1873)(1).

Prays citri, Mill., Icon., t. 150, ff. 17-20(2); Spuler, Schmett. Eurp., II, 442(3); Grandi, Disp. Ent. Agr., pp. 287-288, f. 285(4); Essig, Calif. Mthly. Bull., II, 722-723, f. 389 (1913)(5); Meyr., B. J., XXIII, 125 (1914)(6); Fletcher, Entom. Note No. 89, f. 16 (1916)(7); Quayle, U. S. A., Agr. Dept. Bull. 134, p. 22 (1914)(8); Proc. Second Entl. Meeting, pp. 17, 212 (1917)(9).

Prays nephelomima, Meyr., Pr. Linn. Soc. N. S. W., 1907, 76(10).

A widely-distributed species recorded from the South of France, Corsica(1,4) Sicily(2, 4, 8), the Canary Islands, New South Wales(10) and the Philippines(5, 6). Within our limits known to occur in Ceylon (Colombo, Maskeliya and Madulsima)(6), in North Coorg(6), and at Pusa(9) and will doubtless be found to be widely distributed in India. We have specimens from Maskeliya and Pusa.

The larva has been recorded as a serious pest of the orange and other species of *Citrus*, feeding in the shoots and eating into all the flower organs, whilst in the Philippines the larva has been found to make a gall in the rind of orange fruits.

Eggs are deposited apparently upon the calices or peduncle of the flower, usually just prior to opening, the young larvæ boring through into the interior of the flower, which is destroyed; pupation usually within the flower, but also in protected places on the leaves or forks of the twigs and branches(8).

Fig. 1. *Prays citri.* (The small outline figure shows the natural size.)

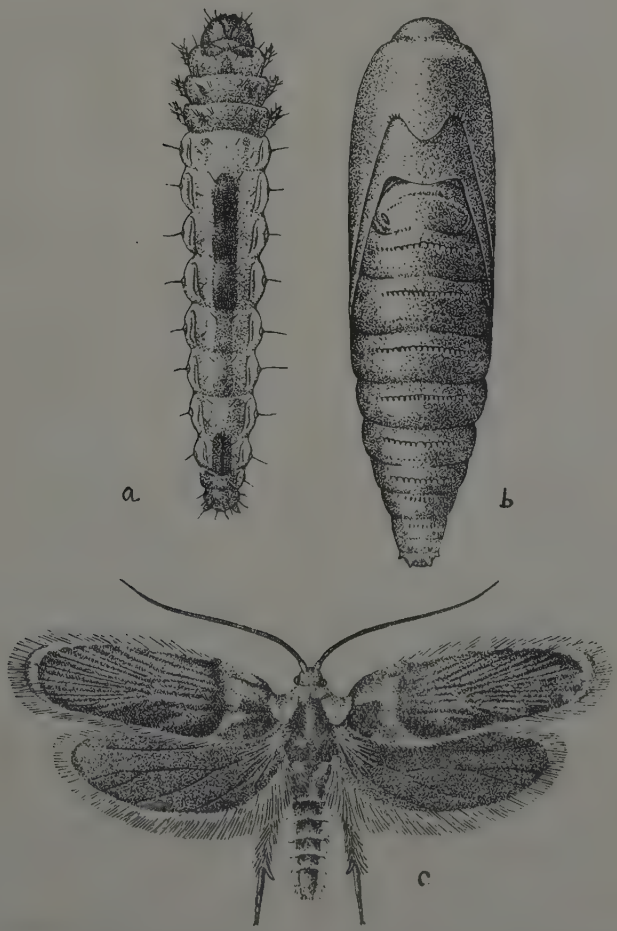


Fig. 2. *Comocritis pieria*:—*a*. Larva; *b*. pupa; *c*. moth: all magnified (x 9).

HYPONOMEUTA MALINELLA, Z.

Hyponomeuta malinellus, Zeller, Isis 1844, 220 ; Wlsm., P. Z. S., 1885, 883.

Recorded from Poona by Lord Walsingham but probably in error. It is not otherwise known to be Indian, although quite likely to be (or to have been) introduced with garden shrubs. Its distribution includes Central and Southern Europe, Asia Minor and Japan.

HYPONOMEUTA LAPIDELLA, WLSM.

Hyponomeuta lapidellus, Wlsm., P. Z. S., 1880, 86, t. 12, f. 1.

Described from Dharmsala(1).

" Larva pale yellowish ochreous, with a double row of elongate black spots just touching each other on the middle of each segment, and connected by a slender black subdorsal line, except between the third and fourth segment, where it is interrupted by a band of the pale ground-colour. Below the subdorsal line is a row of reniform black spots on each segment after the fourth. Head black ; second segment with two brownish-fuscous plates divided by a yellowish line. Anterior legs black ; prolegs yellowish ochreous ; a few single scattered hairs on each segment. Larvæ found at an elevation of about 4,500 feet near Dharmsala, 12th July, feeding on " soongroo " (wild *Salvia*) ; moths emerged 1st August(1).

ATTEVA FABRICIELLA, SWED.

Tinea fabriciella, Swederus, Kngl. Svensk. Vet. Ak. nya Handl., VIII, 277 (1787)(1).

Corinea niviguttella, Wlk., Cat., XXVIII, 542-543 (1863)(2).

Atteva fabriciella, Wlsm., in Swinh. Cat. Het. Oxf. Mus., II, 559 (1900)(3) ; Fletcher, S. Ind. Ins., pp. 461-463, f. 338 (1914)(4).

Common throughout Southern India, from Bombay and Nagpur southwards. Also known from Borneo.

" The eggs are creamy-white, rounded, flattened, and beautifully sculptured ; they are laid, usually on the lower surface of leaves, either singly or in small groups. The caterpillars live gregariously in a common web of fine silk spun over the leaves and shoots of the foodplant, which, in conjunction with larvæ of *Eligma narcissus*, they may sometimes completely defoliate. The full-grown caterpillar is about 20 mm. long, moderately stout, smooth, with scattered short hairs arising from small whitish warts, head blackish, body greenish-grey with paler longitudinal stripes, one faint one down the back edged on either side by a more distinct stripe, and a well-defined stripe along each side. Pupa orange-brown, in a transparent boat-shaped cocoon spun

in the common web ; pupal period about ten days. Foodplants :—*Ailanthus excelsa* "(4).

We have this species from Coimbatore, Trimulgheri, Nagpur and Ahmedabad, in all cases bred on *Ailanthus*.

ATTEVA NIVEIGUTTA, WLK.

Atteva niveigutta, Wlk., Cat., II, 526-527 (1854)(1) ; Moore, P. Z. S., 1867 669(2) ; Wlsm., in Swinh. Cat. Het. Oxf. Mus., II, 558 (1900)(3).

Recorded from Bengal(2, 3) and Sylhet(1, 3). Lord Walsingham's record(3) of its occurrence in China is probably an error for *A. brucea*, Mo. We have it from Sikkim and ? Bhutan.

Larva feeds on *Ailanthus excelsus*, residing in a common very fine web, at times a perfect pest, denuding the tree of its leaves (*Bonavia*)(2).

ÆTHERASTIS CIRCULATA, MEYR.

Ætherastis circulata, Meyr., Exot. Micr., II, 190 (1918)(1).

Bred at Trevandrum, Travancore, in May from larva on *Eugenia ambolana*(1).

COMOCRITIS PIERIA, MEYR. (PLATE XXXII, FIG. 2.)

Comocritis pieria, Meyr., B. J., XVII, 416 (1906)(1) ; Antram, Bark-eating Borers of Tea, pp. 16-17, f. 9 (1907)(2).

Originally described from Neboda, in Ceylon(1). Also recorded from Assam(2), Duars(2), Cachar(2) and Sylhet(2). We have it from Matale (Ceylon).

Larva in galleries on bark of *Hevea brasiliensis* (Para Rubber)(1). Larva pale yellow, much flattened, about 12 mm. long ; head brown, thoracic segments enlarged. It forms a thin silken web, exactly resembling the bark of tea-bushes in colour ; this often covers a considerable portion of the stems, chiefly, however, the thicker branches, low down portions of the bush, and the under side of overhanging branches, this last being a very favourable site. The larva only eats a thin layer of bark from the surface. Pupa under the larval web. Adult emerges in April and May. Foodplant ; tea(2).

" In Cachar and Sylhet, where the old style of pruning is still kept up . . . . . these insects are more plentiful ". Checked in Assam by removal at pruning time of all twiggy growth, dead wood, etc. (Andrews, *in litt.*, 7th March 1916).

ETHMIA ASSAMENSIS, BUTL.

Hyponomeuta assamensis, Butl., T. E. S., 1879, 6(1).

Azinis assamensis, Cotes and Swinh., Cat. Moths Ind., p. 719 (1889)(2).

Ethmia assamensis, Durrant, P. Z. S., 1906, 496([3]) ; Meyr., Cat. Hyponomeuta, p. 27 (1913)([4]).

Psecadia hockingella, Wlsm., P. Z. S., 1880, 90-91, t. 12, ff. 8, 9, 9*a*([5]).

Occurs from Kashmir and Dharmsala along the Himalayas to Sikkim. Cachar and the Naga Hills. We have it from Khatmandu (Nepal).

Larva on " Poonah " (probably *Ehretia serrata*) in April and May at Dharmsala. Described([5]) as " wonderfully active with a snake-like motion, exceedingly swift, either backwards or forwards at pleasure " (*Hocking*).

Description of preserved larva :—" pale yellow and black, with a tinge of orange at the side of each segment. Head black with a pale yellowish stripe across the face, second segment orange and black. Along the middle of back is a row of conspicuous pale yellow spots, two on each segment after the third, the anterior spot slightly indented at the sides and behind, sharply indented in front with black, the second somewhat square, with a black spot in its centre. On each side of the back is a reduplicated black stripe, containing about three pale yellowish spots on each segment. The sides of the segments about the spiracles are pale yellowish with an orange tinge, spotted with black ; and above the legs runs a narrow black festooned stripe. There are several wart-like tufts of thinly growing hairs on each segment. Anterior legs black, prolegs pale yellowish "([5]).

ANTICRATES LUCIFERA, MEYR.

Anticrates lucifera, Meyr., B. J., XXIII, 128-129 (1914)([1]).

Described from Karwar, in North Kanara ; larva on *Sideroxylon tomentosum* (*Sapotaceæ*) ; cocoon on leaf([1]).

COLEOPHORIDÆ.

The early stages of no Indian species seem to be known.

Outside of India, the members of the genus *Coleophora* usually mine in leaves or seeds as young larvæ, later on living in a portable case, composed of cut fragments of leaf fastened together with silk, or of the empty husk of a seed which they have eaten out. The larvæ have all legs present, but the abdominal prolegs are little developed, as they are not used for walking ; plate of 2 well-developed, usually dark and divided medially ; plates of 3 and 4 usually developed, divided medially and transversely ; plate of 13 developed. Numerous life-histories in this group are described in Volumes 4 and 5 of Stainton's *Natural History of the Tineina*.

Rhadinastis contains an Australian species whose larva is a true gall-producer on *Acacia*.